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Oxygen Sublattice Tuning of Magnetic Order in the Kagomé Antiferromagnet $YBaCo_4O_{7+\delta}$[1] J.F. MITCHELL, O. CHMAISSEM, H. ZHENG, Argonne National Laboratory, A. HUQ, Oak Ridge National Laboratory, P. STEPHENS, SUNY Stony Brook — $YBaCo_4O_{7+\delta}$ (Y-114) is a relatively new compound that contains the Kagomé net motif and is structurally related to the pyrochlore lattice, differing only in the stacking of the triangular layers that link successive Kagomé planes. We have previously shown that the stoichiometric compound orders antiferromagnetically (AFM) at T_N = 108 K into a structure that compromises a collinear arrangement along the *c*-axis and a 120^o structure (akin to the well-known $\sqrt{3}$x$\sqrt{3}$ supercell) in the Kagomé planes. This ordered state is considered to result from a symmetry-breaking structural distortion that lifts the geometric frustration. Here we show from neutron diffraction the effect of added oxygen on the structure and magnetism of the parent compound. By controlling this parameter, we can tune the system from the AFM ordered ground state into a disordered state. We discuss two possible mechanisms for this evolution: (1) suppressed structural distortion leading to geometric frustration, and (2) the formation of S=0 Co^{3+} centers that can break magnetic exchange pathways.

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